

Lucas Busta

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Highlights

- Flexible and dedicated hard worker with exceptional organizational skills and attention to detail.
- Collaborates with domestic and international research groups and individuals via excellent communication and interpersonal skills to successfully accomplish project goals on time.
- Able to carry out multiple projects simultaneously, enabling concomitant pursuits of existing projects, new collaborative works, exploratory experiments, and manuscript writing.
- Seven years research laboratory experience. Excellent skills in chemical analysis including data acquisition, processing, visualization, interpretation, and archival.
- Five years hands-on experience maintaining, repairing, and documenting instrumentation and lab equipment: GC-FID, GC-MS, LC-ESI-MS, and gas delivery systems.

Education

2016 **Ph.D. Chemistry**, University of British Columbia

2011 **B.S. Chemistry**(honors), University of Minnesota - Duluth

2011 **B.S. Biochemistry and Molecular Biology**(honors), University of Minnesota - Duluth

Teaching Experience

University of British Columbia

Vancouver, BC

Graduate Teaching Assistant

2011–present

Guided, motivated, and evaluated students in multiple chemistry courses, received excellent student and supervisor evaluations. Developed skills in guided inquiry teaching methodology.

- 1st year chemistry tutoring center (5–10 students)
 - Responsible for tutoring students in fundamental chemical concepts.
- 3rd year analytical chemistry laboratory (6–12 students)
 - Charged with communicating instrumental design, operation principles, and analytical methodology.
- 2nd year organic chemistry laboratory (15 students)
 - In charge of guiding students through basic chemical reactions and work-ups.
- 3rd year analytical chemistry lecture (90 students)
 - Responsible for leading in-class tutorials, discussions, and group activities. Administered and graded quizzes.

University of Minnesota - Duluth

Duluth, MN

Undergraduate Teaching Assistant

2009–2011

Learned to manage and instruct students in a teaching laboratory setting and collaborate with other teaching assistants to design and implement exam grading rubrics.

- 2nd year analytical chemistry laboratory (30 students)
 - As an undergraduate, coached other undergraduate students in the development of basic analytical chemistry skills: quantitative determinations, spectrochemical analysis, and chromatography.

Technological Experience

LabVIEW: Advanced user

Custom data acquisition and processing

L^AT_EX: Advanced user

Professional typesetting and report writing

Mendeley: Advanced user

Reference collection and management

R: Advanced user

Statistical computing and graphics

D3 Javascript visualizations: Intermediate user

Custom data visualization for complex datasets

Unix, Git(hub): Intermediate user

Task automation and version control

Research Experience

University of British Columbia

Vancouver, BC

Graduate Researcher, Laboratory of Dr. Reinhard Jetter

2011–present

Used chemical techniques to determine the structure of new wax compounds and study the biosynthesis of plant cuticular waxes.

- Scientific achievements

- Chemical synthesis of authentic standards for structure elucidation and enzyme assay
- Extensive literature review and biosynthetic analysis of specialty plant surface lipids
- Experience with GC-MS, LC-ESI-MS, ToF-SIMS, and NMR.
- Detailed chemical analyses of hundreds of plant and algae lipid extracts

- Other achievements

- Developed custom data analysis software to increase throughput allowing extensive collaboration with domestic and foreign research groups.
- Improved and documented laboratory instrument and equipment maintenance routines.
- Maintained and repaired chromatography and MS equipment.
- Constructed and maintained literature and measurement databases.

University of Minnesota - Duluth

Duluth, MN

Undergraduate Researcher, Laboratory of Dr. John Evans

2008–2011

Design and construction of an automated ice-sensing system for bridge decks.

- Scientific achievements

- Developed and implemented custom data acquisition and processing software to sense the formation of ice on a time-domain reflectometry sensor.
- Drafted custom software for spectrophotometric data acquisition and processing.

- Other achievements

- Documented the structure and functionality of developed software in written reports.

Conference Presentations

- 2015 **Busta, L.**, Budke, J., Jetter, R.: Cuticular waxes from the leafy gametophyte, sporophyte, and calyptra of the moss *Funaria hygrometrica*, [Oral Presentation](#), BSA 2015, Edmonton, AB
- 2013 **Busta, L.**, Budke, J., Jetter, R.: Hydroxy esters from the gametophyte, sporophyte, and calyptra of the moss *Funaria hygrometrica*, [Oral Presentation](#), Phytochemical Society of North America, Corvallis, OR
- 2011 **Busta, L.** et al: Development of a Time Domain Reflectometry System for the Determination of Ice Formation on Road and Bridge Surfaces, [Oral Presentation](#), Spring Undergraduate Research Symposium, University of Minnesota Duluth, Duluth, MN

Invited Presentations

- 2016 **Busta, L.** The diversity and biosynthesis of cuticular waxes. The Boyce Thompson Institute, Ithaca, NY. (Special seminar)
- 2016 **Busta, L.** The diversity and biosynthesis of cuticular waxes. The Center for Plant Science Innovation, Lincoln, NE. (Special seminar)

2016 **Busta, L.** "Things I wish I'd known before starting graduate research". UBC Chemistry 319: Practical skills for chemical research, Vancouver, BC (Special lecture)

Publications (Total 7)

- in prep* **Lucas Busta**, Reinhard Jetter. The structure and biosynthesis of branched wax compounds in *Arabidopsis thaliana*, *in prep*
- in prep* **Lucas Busta**, Reinhard Jetter. The structural diversity and biosynthesis of specialty plant wax compounds
- in review* **Lucas Busta***, Daniela Hegebarth*, Reinhard Jetter. Changes in cuticular wax coverage and composition on developing *Arabidopsis* leaves are influenced by wax biosynthesis gene expression levels and trichome density
- in review* Ok Tae Kim, Yurry Um, Mei Lan Jin, Young Chang Kim, Kyong Hwan Bang, Daniela Hegebarth, **Lucas Busta**, Radu Racovita, Reinhard Jetter. Transcriptomic Analysis of Methyl Jasmonate-Elicited *Centella asiatica* Leaves and Characterization of Multifunctional C-23 and C-28 Oxidases Involved in Centelloside Biosynthesis,
- in review* Pingtao Ding*, Dmitrij Rekhter*, Yuli Ding*, Kirstin Feussner, **Lucas Busta**, Sven Haroth, Shaohua Xu, Xin Li, Reinhard Jetter, Ivo Feussner, Yuelin Zhang. Systemic Acquired Resistance Deficient 4 encodes a key enzyme for pipecolic acid biosynthesis,
- 2016 **Lucas Busta**, Jessica M. Budke[†], Reinhard Jetter. Cuticular wax coverage on *Funaria hygrometrica* is similar to vascular plants, but wax composition differs between surfaces of the leafy gametophyte, calyptra, and sporophyte capsule, *Annals of Botany*, *in print*
- 2016 **Lucas Busta**, Jessica M. Budke[†], Reinhard Jetter. Identification of β -hydroxy fatty acid esters and primary, secondary-alkanediol esters in cuticular waxes of the moss *Funaria hygrometrica*, *Phytochemistry*, Volume 121, Pages 38-49

Awards (Total \$750)

- 2015 **Graduate Student Travel Award**: University of British Columbia (\$500)
- 2013 **Best Oral Presentation Award**: Phytochemical Society of North America (\$250)
- 2011 **Casmir Ilenda Award for Outstanding Undergraduate Research**: Univ. MN - Duluth
- 2011 **F.B. Moore Academic and Leadership Award**: Univ. MN - Duluth
- 2010 **American Chemical Society Undergraduate Analytical Chemist of the Year**: ACS
- 2010 **Maguire Award for most promising chemistry student**: Univ. MN - Duluth
- 2009 **Maguire Award for most promising chemistry student**: Univ. MN - Duluth

*co-first authors

[†]Collaborator in the analysis of moss cuticles, University Tennessee - Knoxville, 2014-present

References

Research

- Dr. Reinhard Jetter, Professor
 - Biological Sciences Building
 - 6270 University Boulevard
 - Vancouver, BC Canada V6T 1Z4
 - 604 822 2477
 - reinhard.jetter@botany.ubc.ca

- Dr. John F. Evans, Professor
 - UMD Chemistry
 - 227 Chem
 - 1039 University Dr
 - Duluth, MN 55812
 - 218 726 7232
 - jevans1@d.umn.edu

- Additional references available upon request

Teaching

- Dr. Robin Stoodley, Senior Instructor
 - Department of Chemistry
 - 2036 Main Mall
 - Vancouver, BC Canada V6T 1Z1
 - 604 827 5829
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- Dr. Dan Bizzotto, Professor
 - Department of Chemistry
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